

We claim:

1. An isolated nucleic acid molecule from
Magnaporthe grisea that confers rice cultivar CO39-
5 specific avirulence to fungal plant pathogens that
contain the nucleic acid.

2. The nucleic acid molecule of claim 1, which
is AVR1-CO39.

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3. The nucleic acid molecule of claim 2,
having a sequence comprising part or all of SEQ ID NO:1.

4. The nucleic acid molecule of claim 1, which
15 encodes a polypeptide having the features of a
polypeptide comprising a sequence selected from the group
consisting of SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ
ID NO:5, SEQ ID NO:6, SEQ ID NO:7 and SEQ ID NO:8.

5. The nucleic acid molecule of claim 4, which
20 encodes a polypeptide having a sequence selected from the
group consisting of SEQ ID NO:2, SEQ ID NO:3, SEQ ID
NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7 and SEQ ID
NO:8.

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6. A recombinant DNA molecule comprising the
nucleic acid molecule of claim 1, operably linked to a
vector for transforming cells.

7. The cell of claim 1, selected from the

group consisting of bacterial cells, fungal cells, insect cells and plant cells.

9. The transformed cell of claim 8, which is
5 an epiphytic bacterial cell.

10. A transgenic plant regenerated from the transformed cell of claim 8.

10 11. An isolated nucleic acid molecule having a sequence selected from the group consisting of:

- a) part or all of SEQ ID NO:1;
- b) an allelic variant of part or all of SEQ ID NO:1;
- 15 c) a natural mutant of part or all of SEQ ID NO:1;
- d) a sequence hybridizing with part or all of SEQ ID NO:1 or its complement and encoding a polypeptide substantially the same as any of the
- 20 polypeptides encoded by SEQ ID NO:1; and
- e) a sequence encoding part or all of a polypeptide having an amino acid sequence selected from the group consisting of SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7 and SEQ ID
- 25 NO:8.

12. An oligonucleotide between about 10 and about 100 nucleotides in length, which specifically hybridizes with a portion of the nucleic acid molecule of
30 claim 11.

24. Antibodies immunologically specific for the protein of claim 20.

25. A transgenic epiphytic bacterium that
5 expresses a portion of an AVR1-CO39 gene effective to confer rice cultivar CO39-specific avirulence to microorganisms expressing the gene.

26. The transgenic epiphytic bacterium of claim
10 24, which expresses CRF3 of SEQ ID NO:1, or a functional equivalent.

27. A method of enhancing the scope of resistance of rice cultivar CO39 plants to pathogenic
15 microorganisms, which comprises treating the plants with a polypeptides produced by expression of AVR1-CO39, in an amount effective to trigger expression of a CO39-specific R gene in the plants.

20 28. The method of claim 27, comprising treating the plants with a solution comprising the polypeptides.

29. The method of claim 27, which comprises
25 treating the plants with an epiphytic bacterium that expresses a portion of an AVR1-CO39 gene that produces the polypeptides effective to trigger expression of the CO39-specific R gene in the plants.